Attempting to Come to Grips with Alternative Perspectives

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Where to begin, where to begin? Merrill's (1991) interpretaion of Bednar, Cunningham, Duffy, and Perry (1991), in comparison to the ideas we intended to communicate and the interpretations many others have made in reading the paper, is a clear example of the multiple realities that result from constructivist activity. He has, in our opinion, identified some of the clear points of contrast between his own ID_2 and constructivism, for example, the issue as to whether process can be separated from content and the issue of whether learning can be categorized into well-defined types of outcomes which match to various universal instructional strategies exclusive of content domain. We see constructivism, in *all* of the theoretical representations we have read, offering a clear alternative on these issues. However, much of the remainder of Merrill's (1991) assertions concerning our perspective on constructivism are simply not consistent with our views.

For example, Merrill interprets us as suggesting that all opinions or constructions are equally viable. We have never subscribed to this view, which is better known as deconstructivism. Rather, we emphasize the importance of testing one's own understandings via collaborative activities. Consistent with Vygotsky (1978) we emphasize the social negotiation of meaning or understandings. Indeed, collaboration as a means of testing ideas and evaluating alternative perspectives is central to our view. With that example in mind we will begin our social negotiation of understanding the constructivist view in general and Bednar *et al.* (1991) in particular by responding to Merrill's points.

Using a divide and conquer approach, Merrill draws a sharp contrast between the Cognition and Technology Group (1991) and Spiro *et al.* (1991) on one hand and Bednar *et al.* (1991) on the other, referring to the former as a "more moderate constructivism" with which his views are consistent and the latter as "extreme constructivism." A primary basis for this "grouping" of perspectives is Merrill's interpretion of how each views the prespecification of knowledge in building instruction. Before addressing that issue in particular, let us note that it is totally appropriate that there be different interpretations of the implications of a constructivist epistemology for instructional design. However, we believe our perspectives on constructivism are more similar than distinct from these other researchers, even in relation to the prespecification of knowledge.

Merrill's view of the prespecification of knowledge is heavily associated with what information is provided in the learning context. At the base, he seems to view knowledge and information as identical. . . . For example, Merrill states,

> ID_2 stands in direct opposition to these extreme constructivist views. We have proposed a syntax for knowledge representation . . . which assumes that knowledge, across subject matter areas, can be represented in knowledge frames of three types—entities, activities, and processes (1991, p. 47).

Merrill seems to imply that any learning situation which is not totally devoid of content is the result of the prespecification of the knowledge base. That is, the prespecification of knowledge is judged by the mere provision of any content. However, we view instructional designers as providing information, not knowledge. From our view the prespecification of knowledge becomes apparent in how you measure learning—in what the learner can do. Any learning activity will contain content, but if learners are not held responsible to "learn" that content domain in "the" way which reflects the developer's view of the domain, then prespecification of knowledge has not occurred.

What the Cognition and Technology Group (1991), Spiro *et al.* (1991), Bednar *et al.* (1991), Perkins (1991), and Cunningham (1991) suggest is that the process of learning in any domain emerges from the domain and that any learning activity should be in the context of a larger task goal (a macrocontext). That is, the reason for learning something—the criterion for understanding—is always an integral part of the task complex.

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Providing that context has a vastly different impact on the cognitive demands, and hence the learning, than simply providing a verbal description of the context or telling the learner about the relevance. The segment must be realistic (in terms of cognitive demands), have a large number of components from which the students extract those elements which are appropriate to their solution of the problem, and be part of a larger issue or task—one that, in an educational system, will almost certainly extend beyond a single discipline. Knowledge is not absent, it is simply not predetermined as the outcome of the learning experience.

If Merrill chooses to claim consistency with Spiro *et al.* and the Cognition and Technology Group, though disagreeing with Bednar *et al.*, he would also have to believe that learners do not develop schema or propositional networks during learning that are later retrieved to guide performance (Spiro *et al.* 1991). Merrill would have to believe that instead learners develop rich, context-based meanings of concepts so that in new situations they have the flexibility to construct schemas that will guide performance (Spiro *et al.*, 1991; Cognition and Technology Group, 1991). Further, Merrill would have to agree with Spiro *et al.* that instruction should not be sequenced from simple to complex if simple means stripping away the complexity of the context (the richness of the environments in which the concept is relevant). Each of these characteristics of constructivist learning environments emerge as implications from the epistemology.

Merrill, however, asserts that instructional technology should be an eclectic field, free to draw in practice from any theoretical base no matter how inconsistent the assumptions of those various bases. In fact, while he claims a cognitive science base to his own theory, he retains the concept of categories of knowledge from behaviorism and then suggests that "some of the assumptions and prescriptions" of constructivism are consistent with his theory. In his knowledge representation system, he states:

> The philosophical question of the nature of meaning can be safely ignored. Instruction, in large measure, communicates accepted meaning. The developer of instruction explicitly desires that the learner adopt the meaning intended by the developer, and not reach a separate and personal interpretation of that meaning. Although being able to reach such personal interpretations is an important part of being educated, *most instruction*, particularly most uses of automated instruction, *concerns transferring, as effectively and efficiently as possible, previously determined interpretations* (Jones, Li, and Merrill, 1990, p. 12). (emphasis added)

Obviously our perspective is directly opposed to this view of learning. In Bednar *et al.* and in Duffy and Knuth (1990), we have suggested that one of the dominant views of instruction is that it consists of the transfer of knowledge from the instructor (or instructional system) to the learner. Merrill has accused us of presenting a strawman view. However, the quotation above seems to reflect just such a view. Perhaps our most basic disagreements are over what the goals of education should be and what the nature of instructional science should be.

Merrill also seems to mistake constructivism for discovery learning, when he calls attention to the need for cost-effective instructional design. He implies that providing each learner with a unique instructional experience would be far too expensive. What he fails to see is that we are already providing each learner with a unique experience simply because each learner brings a unique set of understandings, experiences, and personal goals to each learning experience. The problem from a constructivist point of view is that we are not making that individual experience relevant to each learner in a way which facilitates development of a personal perspective, one that will transfer from the school environment to the real-world application.

What do we suggest instructional designers do from a constructivist approach? We would turn from structuring instruction to designing environments in which learning can take place—environments which are characterized by: rich contexts; authentic tasks; collaboration for the development and evaluation of multiple perspectives; an abundance of tools to enhance communication and access to real-world examples and problems; emphasis on reflective thinking; modeling of problem solving by experts in the content domain; and apprenticeship/mentoring relationships to guide learning. The phenomenaria described by Perkins (1991) are precisely the kind of ideal learning environments we would seek. It is possible that development of these environments would be less expensive than the intense analysis required by traditional instructional design just for the prespecification of knowledge and the establishment of learning objectives.

Since the original expression of our ideas did not communicate these characteristics to Merrill, let us put that text to the side and offer a different approach to our thinking. Let us provide two examples contrasting objectivist and constructivist learning.

A first example: Qualifiying exams in which graduate students are all given a reading list and then tested on the contents of that reading list is an objectivist* strategy toward "Qualifying." The assessment questions in that system have nothing to do with the individual student—they have only to do with the committee's view of the content domain. Note also that the task of the student qualifying—to master this material to answer whatever questions might be asked—is not representative of what the individual will do as a PhD in the field.

An alternative, constructivist strategy might be papers in several areas of the content domain. This might take place over perhaps two years of the graduate work. It would be up to the student to define the issue or focus within the specified topic area and to decide on the approach to the issues. Evaluation might be how well the student considered and evaluated the perspectives on the issue both in the text and in an oral discussion during which the student would be asked to reflect upon his or her approach to the issues. Note that the task is one the student will hopefully engage in as a PhD—it is authentic. Note also that the content cannot be defined *a priori* except in general terms. Certainly there is no prespecification of knowledge.

A second example using technology: The most typical way of teaching history is to present facts, dates, personalities, trends, and theories either through lecture or readings. The objective is too often to learn dates, describe sequences of events, etc. More creative approaches, many of which have emerged as a result of a design process, typically share these sort of content oriented objectives.

Students in the first author's seminar recently designed a course to teach 10th grade American History from a constructivist perspective and using hypertext. Three excellent designs were generated but we will describe only one here (Honebein, Fishman, Chong, and Kim, 1991).† A front end analysis included an initial and ongoing dialogue with a 10th grade American History teacher, the editor of the *Journal of American History*, and the director of the Center for History Making in America. Through this analysis the developers learned that the central issue in history is detective work, and that students must learn that any reporting of history represents a particular perspective. The fun of being a historian is in gathering and trying to understand these different perspectives.

A database of original documents is the core of the curriculum for the history course that was designed. The complete database (the students only developed a prototype) is far more extensive than any domain of knowledge the learners could master, and certainly the designers did not devise a test of that subject matter. Instead access to the database is managed through a series of problem solving tasks. For example, in the study of the Truman Doctrine, the 10th graders take the position of advisors to President Truman. They are given a choice of a problem area relevant to the development of the Truman Doctrine (e.g., political problems in Turkey or Greece) where Truman needed help. Students receive a brief scenario of the "situation" and the alternative kinds of advice they might offer. It is then up to them to work in the database to develop a perspective on the situation. They can also go to the Secretaries of Defense, State, and Commerce to get their points of view on the "best" strategy (each Secretary provides a perspective on how he approaches problems—what databases he tends to focus on and what cautions he exercises in using that database). In the plan for the use of this system, the 10th graders would work in groups, sharing the workload and points of view. The instructor would serve as a coach and model, working with the groups as they developed and evaluated perspectives. Evaluation could not be based on the mastery of any prespecified information (or knowledge). Instead, evaluation would be of students' developing the perspective and, most importantly, of providing a rationale for a defense of their point of view.

What is distinct in each of these examples is that there is no prespecification of content to learn nor any expectation that each learner will take the same thing away from the learning experience. As much as possible the activity that the student engages in is authentic. The role of the instructor is to model and guide. Additionally learner control—the learner's judgments as to what should be done and why— is seen as an integral part of the learning process. In each of these learning environments, it would be strange indeed to consider the nature of the task without learner control. The approach

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*Two points of clarification may be required. First, by "objectivist" we are referring to the view of learning best captured in the quotation from Jones, Li, and Merrill (1990) presented earlier and the position described by Bednar *et al.* (1991) and Cunningham (1991), and presented in Dick and Carey (1990). Second, we do not mean to imply that the approach is a necessary outcome of an objectivist design—many different outcomes are possible. Rather, it is an acceptable and not atypical approach from that perspective, but clearly not one that would arise from a constructivist perspective.

†The other designs are described in Brown, Choi, Goldstein, and McMahon (1991) and Brescia, Carr, Chen, and Garfinkle (1991).

does not preclude guiding the student. Indeed, apprenticeship is central to the pedagogy. Finally, with specific reference to the history example, we might note that while the Truman Doctrine was the topic, the students' learning extended well beyond the simple principle and statements or reason for the Truman Doctrine. They learned about a variety of military, social, political, and economic facts about the countries involved, some key members of the US cabinet, and a variety of process and problem solving skills.

We hope that these comments and examples will help to clarify the conceptual framework we were trying to present in Bednar *et al.* (1991) and will highlight the potential value of this framework in the design of instruction. Merrill (1991) suggests an empirical test to determine whether constructivism or ID_2 best serves the field. We have our doubts about the effectiveness of the experimental approach providing a test as to which approach best serves the field—at least in any near-term sense. The two approaches seem to be about different things, constructivism is not aiming to produce the kinds of outcomes Merrill advocates (acquisition of previously determined interpretations). Hence we see extreme difficulty in creating learning environments that provide reasonable tests of the two views. While we think the research will help clarify details of the points of view, we prefer a developmental model where practice in the field is constantly evaluated in a formative sense and the results are applied to examine and adapt the model in a continuous cycle. We also prefer the emergence of a collaborative dialog in which we and our colleagues across the world present our perspectives and our evidence, each using the dialog to adapt our personal practice and theory of instructional design.

That important dialog is underway already. At professional discussions others have described the move to a constructivist epistemology as a paradigm shift with tremendous implications for the field. We look at Bednar *et al.* (1991) as an invitation to dialog within a community of which we consider ourselves a part, not one we stand in opposition to. Merrill asserts that our views are an insult to instructional designers "who have dedicated their life to trying to build better instruction." He states that we "suggest that IST has deliberately developed instruction which is ineffective because instructional designers believe that this inadequate instruction is better." Were Merrill's assertions true we would be criticizing ourselves. Within the group of authors are more than thirty-eight years of designing instruction applying traditional instructional design models. That we are now considering constructivism is our way, in the best tradition of instructional technology, of trying to build better instruction.

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Your Comments?

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